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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,362	09/05/2003	Ingolf Groening	2735	8248

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EXAMINER
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FLANDRO, RYAN M

ART UNIT	PAPER NUMBER
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3679

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/656,362

Applicant(s)

GROENING ET AL.

Examiner

Ryan M Flandro

Art Unit

3679

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/18/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Priority*

1. The Examiner notes that Applicant is claiming priority to German Application DE 10241515.3, filed 09/07/2002. The certified copy of this document has not been received, however. As such, the requirements under 35 USC §119(a)-(d) have not been met at this point in the prosecution.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, claim 1 recites at least one of the abutment surfaces “being provided with a thin metallic coating with a thermal conductivity having a value smaller than approximately 2 W/Km (Watt x Kelvin<sup>-1</sup> x Meter<sup>-1</sup>)”. The thermal conductivity of any material is a function of relative operating temperature (e.g., the thermal conductivity of Titanium is 17 W/Km *at room temperature*<sup>1</sup>). The specification of the instant application does not provide a specific operating temperature range at which the

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<sup>1</sup> See Kalpakjian, Serope. Manufacturing and Engineering Technology, Third Edition. Addison-Wesley Publishing Co. 1995. Table 3.1, pgs104-07.

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particular coating is intended to have the claimed thermal properties. In this regard, undue experimentation would be required to carry out the invention. See In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1998); MPEP § 2164.01(a) and § 2164.04.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-14 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "having a value smaller than approximately 2 W/Km" in lines 8-9 of claim 1 is a relative phrase which renders the claim indefinite. The term "approximately" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. That is, it is not clear whether the recited range includes values just above 2 W/Km, and if so, what maximum value above 2 W/Km might be included. Also, as set forth above, the recitation does not make it clear as to what operating temperature is required for the thin metallic coating to reach the specific thermal conductivity.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-9, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieber (US 4,739,206) in view of Kalpakjian<sup>2</sup>.

a. Claim 1, as best understood. Sieber shows a connection element **10** composed of metal (see column 4 line 49-50 – low carbon steel) and provided for a releasable connection of an electric motor **12** with a machine **16**, the connecting element **10** comprising at least one first abutment surface **18a,b** mountable on a wall **16** of the

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<sup>2</sup> *Id.* at pgs 139-141, 641-648, 990-1004.

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machine, and at least one second abutment surface **20,24** fixedly connected (via **32a,b**) with the electric motor **12** (see figures 1 and 3-7; columns 3 and 4).

Sieber lacks disclosure that at least one of said at least one first abutment surface and said at least one second abutment surface is provided with a thin metallic coating with a thermal conductivity having a value smaller than approximately 2 W/Km.

Kalpakjian, however, teaches that case hardening processes (i.e., providing a thin metallic coating to a part – see pgs 990-1004), such as carbonitriding and nitriding, are well known for alteration of only the surface properties of a part (see pg139). Kalpakjian teaches that case hardening “is particularly useful for improving resistance to surface indentation, fatigue, and wear” and also points out typical applications such as “gear teeth, cams, shafts, bearings, fasteners, pins, automotive clutch plates, tools, and dies” where through hardening “would not be desirable, since a hard part lacks the necessary toughness for these applications” (see p139). Furthermore, Kalpakjian specifically teaches, albeit in the context of coated tools, that coating materials should exhibit high hardness at elevated temperatures and *low thermal conductivity* and that some of the common coating materials include TiN, TiC, TiCN, TiAlN, CrC, etc (see pgs 645 and 649).<sup>3</sup>

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a thin metallic coating having a low thermal

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<sup>3</sup> Because the instant application does not disclose or teach any special alterations to the recited coatings which might change thermal conductivity, the Examiner has reasonably assumed that the thermal conductivity of any of the aforementioned coating materials will be below 2 W/Km at some temperature since this physical property value is inversely related to increasing temperature. That is, since thermal conductivity values are inherent to the coatings, a teaching of the specific coatings required by the claims inherently includes the specific physical properties of each material.

conductivity on at least one surface of the connecting element **10** of Sieber to improve the surface characteristics thereof in order to extend the life of the part while maintaining the toughness of the underlying substrate as taught by Kalpakjian.

b. Claims 2-9, as best understood. Kalpakjian teaches some of the common coating materials include TiN, TiC, TiCN, TiAlN, CrC, etc. with a thickness on the level of 2-10 $\mu$ m (see pgs 645 and 649). In any event, it has been held that the selection of a known material based upon its suitability for the intended use is an obvious technical variation within the skill of the art. In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Thus, one of ordinary skill in the art would recognize that the aforementioned coating materials could be substituted for one another depending on the design requirements of the connection element and electric motor.

c. Claims 12 and 13. Sieber further shows and discloses said second abutment surface **20,24** is provided with a throughgoing opening **32a,b** for screw connection of the electric motor **12** with the connecting element **10** (see figure 1). Furthermore, because Kalpakjian teaches that the aforementioned coatings may be deposited by several different processes, such as sputtering (see pg997), the through going opening **32a,b** will be provided with the thin metallic coating.

9. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (US 6,450,782) in view of Kalpakjian.

a. Claim 1, as best understood. Sakamoto shows a connection element **38** composed of metal and provided for a releasable connection of an electric motor **10** with a machine **24**,

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the connecting element 38 comprising at least one first abutment surface mountable on a wall 24 of the machine, and at least one second abutment surface fixedly connected with the electric motor 10 (see figures 2 and 3; columns 2 and 3).

Sakamoto lacks disclosure that at least one of said at least one first abutment surface and said at least one second abutment surface is provided with a thin metallic coating with a thermal conductivity having a value smaller than approximately 2 W/Km.

In view of Kalpakjian, as applied above, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a thin metallic coating having a low thermal conductivity (below 2 W/Km) on at least one surface of the connecting element 38 of Sakamoto to improve the surface characteristics thereof in order to extend the life of the part while maintaining the toughness of the underlying substrate as taught by Kalpakjian.

b. Claims 2-9, as best understood. Kalpakjian teaches some of the common coating materials include TiN, TiC, TiCN, TiAlN, CrC, etc. with a thickness on the level of 2-10 $\mu$ m (see pgs 645 and 649). In any event, it has been held that the selection of a known material based upon its suitability for the intended use is an obvious technical variation within the skill of the art. In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Thus, one of ordinary skill in the art would recognize that the aforementioned coating materials could be substituted for one another depending on the design requirements of the connection element and electric motor.

c. Claims 10 and 12. Sakamoto further shows and discloses first and second abutment surfaces provided with at least blind holes with an inner thread and throughgoing



openings (see figure 3) for screwing connection of the connecting element **38** on the machine **24** and/or on the electric motor **10**. These are well known connection structures for securely joining two elements of any type.

d. Claims 11 and 13. Further, because Kalpakjian teaches that the aforementioned coatings may be deposited by several different processes, such as sputtering (see pg997), the threads in the blind hole and inner surface of the through going opening will be provided with the thin metallic coating when exposed to the deposition environment.

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Sieber and Sakamoto in view of Kalpakjian, further in view of Cramer, Jr. (US 3,066,449) (Cramer). The combinations of (1) Sieber and Kalpakjian and (2) Sakamoto and Kalpakjian both fail to teach or disclose that the connecting element has integrated cooling conduits for circulation of a cooling fluid. Nevertheless, inclusion of cooling conduits in an element connected to a heat-emitting member is old in the art as demonstrated by Cramer. In figure 1, Cramer teaches conduits **22** in an engine foundation and mounting assembly **10** “to have a cooling effect on the bedplate” (column 4 lines 1-2; see also column 1 lines 53-63 and column 2 line 50 – column 3 line 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include cooling conduits in the connection element to reduce heat transfer from the engine or motor as taught by Cramer.

*Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to coated components subject to super-heated environments:

U.S. Patent 6,455,173 to Marijnissen et al (see especially column 1, lines 54-65 providing reasoning behind coating components in an engine/motor assembly)

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan M Flandro whose telephone number is (703) 305-6952. The examiner can normally be reached on 9:00am- 6:00pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (703) 308-2686. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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November 17, 2004



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